

19. (Twice Amended) The catalyst system of claim 17 wherein the [ionic catalyst is prepared using an] noncoordinating anion precursor [that] is a halide salt of Group 13-16 metals or metalloids.
20. (Twice Amended) The catalyst system of claim 19 wherein the metal complex to noncoordinating anion precursor molar ratio is from about 10:1 to 1:10.
21. (Twice Amended) The catalyst system of claim 1 wherein said complex [is] has been treated with a noncoordinating anion precursor to form an ionic catalyst comprising a metal cation and a noncoordinating anion.
30. (Once Amended) The catalyst system of claim 1 wherein [the bidentate ligand stabilizes] LMX_r has a square planar geometry.
31. (Once Amended) The catalyst system of claim 6 wherein [the bidentate ligand stabilizes] LMX_r has a square planar geometry.
32. (Once Amended) The catalyst system of claim 13 wherein [the bidentate ligand stabilizes] LMX_r has a square planar geometry.

REMARKS

Request for Withdrawal of Finality

The Examiner has made the second Office Action dated March 29, 1999 final. The Applicants respectfully request reconsideration of the finality of the Office Action for the following reasons.

In accordance with the MPEP § 706.07(a), *"second or any subsequent actions on the merits shall be final, except where the examiner introduces a new ground of rejection that is neither necessitated by applicant's amendment of the claims nor based on information submitted in an information disclosure statement filed during the period set*

forth in 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p). (emphasis added)" In the Office Action under response, the Examiner raised a new ground of rejection, namely the rejection set forth in Paragraph 11 of the Office Action, rejecting claims 1-5, 13-21, 30 and 32 under 35 U.S.C. § 102(e) in view of Brookhart et al. This rejection was not previously raised in the first Office Action dated October 6, 1998. Accordingly, the Examiner has raised a new ground of rejection in the Office Action under response.

It is respectfully submitted that the new ground of rejection was not necessitated by the Applicants' amendments to the claims set forth in the response dated February 8, 1999. The nature of the amendments was such that the scope of the claims was not changed. The amendments were made to better define terms in the independent claims and to otherwise clarify language in the claims, in response to the Examiner's request for clarification in the first Office Action. However, the clarifying terms of the independent claims were defined in the application as originally filed, as indicated in the response dated February 8, 1999. The terms in the claims examined in the first Office Action had a special meaning which was clear in the specification as originally filed (*Markman v. Westview Instruments, Inc.*, 52 F.3d 967, 34 USPQ2d 1321 (Fed. Cir. 1995) (in banc), *aff'd* 517 U.S. 370, 38 USPQ2d 1461 (1996)). However, in order to provide clarification requested by the Examiner, the claims were amended by importing definitions from the specification, as originally filed, into the claims. Accordingly, the scope of the claims was not affected by the amendments introduced in the February 8, 1999 response.

The Brookhart et al reference, or its corresponding PCT publication WO96/23010 considered by the Examiner on September 27, 1998 but not cited, could equally have been cited against the claims examined in the first Office Action as the claims amended in the response dated February 8, 1999. Therefore, because the clarifying amendments did not change the scope of the claims, it is respectfully submitted that the claim amendments did not necessitate the new ground of rejection by the Examiner.

Furthermore, the new ground of rejection is not based on information submitted in an information disclosure statement filed during the period set forth in 37 CFR 1.97(c) with the fee set forth in 37 CFR 1.17(p), since no such information disclosure statement was filed. The information disclosure statement bringing WO96/23010 (corresponding to

the cited Brookhart et al reference) to the Examiner's attention was received in the USPTO on November 7, 1997, before the date of the first Office Action.

For the reasons discussed above, the Examiner is respectfully urged to withdraw the finality of the Office Action under response.

Restriction Requirement

As stated in the response dated February 8, 1999, the Applicants disagree with the Examiner's restriction requirement. The Applicants are aware that this is U.S. patent practice, not PCT patent practice. The MPEP § 803 requires that "*If the search and examination of an entire application can be made without serious burden, the examiner must examine it on the merits, even though it includes claims to independent or distinct inventions.* (emphasis added)" MPEP § 803.01 goes on to state "*IT STILL REMAINS IMPORTANT FROM THE STANDPOINT OF THE PUBLIC INTEREST THAT NO REQUIREMENTS BE MADE WHICH MIGHT RESULT IN THE ISSUANCE OF TWO PATENTS FOR THE SAME INVENTION.* (capital letters used in MPEP § 803.01)". It is respectfully submitted that a search and examination of the entire application can be made without serious burden on the Examiner. Accordingly, the Examiner is urged to reconsider the restriction requirement.

The Examiner grouped claims 1-5, 13-21, 30 and 32 as Invention I because the claims are directed to a late transition metal supported catalyst comprising a bidentate ligand, as allegedly opposed to Invention II (claims 6-8, 10-12 and 31) which are "*drawn to a late transition metal catalyst including a cocatalyst*". However, as in the claims of Invention I, claims 6-12 are in fact drawn to the same late transition metal supported catalyst. Accordingly, claims 1-5, 13-21, 30 and 32 and claims 6-8, 10-12 and 31 have the same technical distinctions that give rise to novelty and unobviousness. Furthermore, the catalyst systems of all claims 1-5, 6-8, 10-12, 13-21 and 30-32 have the same utility. Accordingly, the restriction requirement between the groups of claims in the Examiner's Inventions I and II is improper. In an effort to maintain efficiencies on behalf of the Applicants and the Patent Office, claims 6-8, 10-12 and 31 have not been cancelled and the rejections set forth in the outstanding Office Action have also been addressed for

claims 6-8, 10-12 and 31. The Examiner is urged to reconsider the restriction requirement between alleged groups of Inventions I and II.

The Examiner has not addressed the restriction requirement with respect to Group III in the Office Action under response. However, the Applicants maintain the position set forth with respect to Group III as presented in the February 8, 1999 response.

In the February 8, 1999 response, the Examiner stated that Inventions I and III are related as product and process of use and that the Inventions II and III are related as product and process of use asserting that *"the process of use can be practiced with another materially different product, such as a metallocene catalyst, a Ziegler-Natta catalyst, or a non-supported catalyst"*. The Examiner will note however that independent claims 1, 6 and 13 are directed to a catalyst system for polymerization of olefin monomers. Process claims 22, 28 and 29 are dependent on claims 1, 6 and 13, respectively. Therefore, the withdrawn process claims include all of the limitations of the catalyst system claims 1, 6 and 13. Accordingly, the Applicants will seek rejoinder of the withdrawn process claims when the product claims are found allowable, in accordance with MPEP § 821.04. In view of the rejoinder procedure and in order to expedite prosecution, the Examiner is urged to reconsider the restriction requirement between the product and process of using claims.

"System"

The Examiner has reasserted his allegation that the word "system" has no clear meaning within the scope of 35 U.S.C. § 101. The Applicants respectfully submit that the word "system" has a plain meaning in any English language dictionary. As stated in the February 8, 1999 response, it would be truly burdensome for the Applicants to amend the entire specification and claims, especially when the word "system" has a clear meaning. Again, the Examiner is requested to provide basis for statutory and non-statutory interpretations of the word "system". If the Applicants agree with the Examiner's analysis and the application is found otherwise allowable, the Applicants will make the requested amendments at that time.

Abstract

The Examiner has objected to the abstract because it is not descriptive of the invention now claimed. This objection is respectfully traversed. As required by 37 C.F.R. § 1.72(b), the abstract is a brief abstract of the technical disclosure so that the Patent and Trademark Office and the public generally can quickly determine "*from a cursory inspection the nature and gist of the technical disclosure. The abstract shall not be used for interpreting the scope of the claims.*" As a guideline, the MPEP states in § 608.01(b), that "*with regard particularly to chemical patents, for compounds or compositions, the general nature of the compound or composition should be given as well as the use thereof, e.g. 'The compounds are of the class of alkyl benzene sulfonyl ureas, useful as oral anti-diabetics.'*" (emphasis added). It is respectfully submitted that the abstract does provide the general nature of the claimed catalyst and the use thereof. The abstract therefore complies with requirements of 37 C.F.R. § 1.72(b), using MPEP §608.01(b) as a guideline. The Applicants are not required to repeat the broadest independent claim in the abstract. Furthermore, such an abstract would not be brief as required by 37 C.F.R. § 1.72(b). The Examiner is respectfully urged to withdraw his objection to the abstract.

Objection under 35 U.S.C. § 132

The Examiner has objected to certain of the amendments filed on February 8, 1999 under 35 U.S.C. § 132 as introducing new matter into the disclosure. This objection is respectfully traversed for the reasons discussed below with respect to each of the amendments raised by the Examiner under this objection.

However, as stated in *In re Oda* (170 USPQ 268, 1971) "*'New matter' is a technical legal term in patent law - a term of art. Its meaning has never been clearly defined for it cannot be. The term is on par with such terms as infringement, obviousness, priority, abandonment, and the like which express ultimate legal conclusions and are in the nature of labels attached to results after they have been reached by processes of reasoning grounded on analyses of factual situations. In other words, the statute gives us no help in determining what is or is not 'new matter.' We have to decide on a case-by-case basis what changes are prohibited as 'new matter' and*

what changes are not. ...In a sense, anything inserted in a specification that was not there before is new to the specification but that does not necessarily mean it is prohibited as "new matter"." The Examiner has not provided any indication of why he believes that the amendments introduced in the February 8, 1999 response are deemed to be "new matter". It therefore appears that the Examiner is rejecting the amendments on a *per se* basis. However, as stated in *In re Oda*, changes to an application must be decided on a case-by-case basis.

Deletion of "0"

The Examiner asserts that the deletion of "0" on page 2, line 33 is new matter. In *Ex parte D* (27 USPQ2d 1067, 1993), the Board of Patent Appeals and Interferences held that *"a change, per se, in an application disclosure does not constitute proscribed new matter. The question that first must be answered is whether the initial application provided by the patentee adequately enabled a person skilled in the subject art to practice the invention as claimed."* Accordingly, the Examiner cannot use *per se* analysis to reject the proposed amendment as new matter and must look at the nature of the requested amendment. The correction of a structural formula for a chemical compound does not necessarily constitute new matter. In *Ex parte Marsili* (214 USPQ 904, 1979), the Patent and Trademark Office Board of Appeals reversed the Examiner's decision to refuse entry of an amendment to correct an error in the structural formula of a single ring moiety of a complex compound, effectively the difference between an aromatic and a non-aromatic heterocyclic ring structure. The Board held that *"to refuse correction of the structural formula of Appellant's claimed compounds, which have been found patentable by the Examiner, would lead to the absurdity of issuing a patent which teaches the public in its specification the wrong scientific formula for the new products."*

The amendment requested in the response dated February 8, 1999 was made to correct an error in the numerical definition of a subscript in the general formula of the claimed Group 9, 10 or 11 metal complex. The Applicants noticed the error made when preparing the application in a review of the application prior to filing the response dated February 8, 1999. The nature of the requested amendment to correct the value of the subscript "r" is of a less serious nature than that of *Marsili*. Accordingly, the Examiner is

urged to withdraw his objection under 35 U.S.C. § 132 of the deletion of "0" in the numerical description of the subscript.

Deletion of "covalently"

The Examiner also asserts that the deletion of the word "covalently" on page 3, line 10 is new matter. The amendment was introduced in the response dated February 8, 1999 to correct a typographical error. As stated in that response, the structures shown on page 15 illustrate dative bonds between the N and Ni atoms. While it may be argued that a dative bond, also referred to as a coordinate covalent bond, could be viewed as a type of covalent bond, the Applicants are concerned that the term "covalently bonded" on page 3, at line 10, may be strictly interpreted as *"a bond in which each atom of a bound pair contributes one electron to form a pair of electrons"* (McGraw-Hill Dictionary of Scientific and Technical Terms, 5th edition, pg. 474).

As discussed in more detail below regarding the Examiner's additional rejection of this amendment under 35 U.S.C. § 112, 1st paragraph, even though the bonds between the N and Ni atoms are illustrated with solid single bond lines instead of arrows in the structures illustrated on page 15, it is respectfully submitted that it is clear to a person of ordinary skill in chemistry, that the bonds in the illustrated structures are dative bonds. The N atoms of the ligand, prior to bonding to the metal, have three N-C bonds and a lone pair of electrons. The lone pair of electrons are thus bonded to the Ni atom in a dative bond. However, the Applicants also contemplated other types of bonds between the E and M elements of the catalyst at the time of filing the application. For example, in some of the possible compositions, one of the elements E of the ligand may be bonded to the metal with a covalent bond, while the other element E is bonded to the metal with a dative bond. The nature of the bond itself is not important, but rather that the ligand stabilizes the metal complex. Accordingly, the Examiner is urged to withdraw his objection under 35 U.S.C. § 132 of the deletion of the word "covalently".

Amendment to Abstract

Finally, the Examiner has stated that the February 8, 1999 amendment to the abstract may also be seen as new matter. The Applicants respectfully traverse this

objection. **The amendment to the abstract was made in response to the Examiner's request to do so in Paragraph 7 of the Office Action dated October 6, 1998.**

Specifically, the Examiner had objected to the abstract in that Office Action "because the support of the present claims is not required to contain a metal or metalloid oxide". It does not appear to be efficient for an Examiner to first request an amendment and then reject the amendment as introducing new matter. Furthermore, the abstract is not intended nor designated for use in interpreting the scope or meaning of the claims (37 C.F.R. § 1.72 (b)). The Examiner is urged to withdraw his objection under 35 U.S.C. § 132 of the amendment to the abstract.

The Applicants have addressed each of the amendments which the Examiner regarded as new matter and have provided sound arguments in support of the amendments. The Examiner is therefore urged to withdraw his objections under 35 U.S.C. § 132.

Withdrawn Rejections under 35 U.S.C. § 102(b) and 35 U.S.C. § 103(a)

The Applicants acknowledge the Examiner's withdrawal, in Paragraph 6 of the Office Action under response, of the rejections under 35 U.S.C. § 102(b) in view of Masters and under 35 U.S.C. § 103(a) in view of Drent.

Rejection under 35 U.S.C. § 112, 1st Paragraph

The Examiner has rejected claims 1-5, 13-21, 30 and 32 under 35 U.S.C. § 112, 1st paragraph as *"containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention"*.

Specifically, the Examiner states that the specification as originally filed required a covalent bond between the transition metal of the metal complex and the E atoms of the ligand, on page 3, line 10 and in the exemplary formulas on page 15, Table I. As stated in the response filed February 8, 1999 and discussed above, the word "covalently" was deleted from page 3, line 10 because it was a typographical error. The Applicants were

concerned that the word "covalently" would be strictly interpreted as "*a bond in which each atom of a bound pair contributes one electron to form a pair of electrons*" (McGraw-Hill Dictionary of Scientific and Technical Terms, 5th edition, pg. 474), as opposed to a dative bond, or coordinate covalent bond, wherein a pair of electrons is contributed by one atom. However, the Applicants were aware at the time that the application was filed, that the bonds between the N and Ni atoms of the exemplary structures in Table I of page 15 were not covalent bonds according to the above recited definition.

The Applicants indicated in the February 8 response that support for the amendment deleting "covalently" from the specification could be found in the exemplary structures on page 15, Table I which illustrates dative bonds. The Examiner is rejecting this statement, on the basis that a dative bond is typically illustrated by an arrow from the atom donating electrons to the atoms receiving the electrons. The Applicants agree with the Examiner that dative bonds are often illustrated with arrows. However, dative bonds are not always illustrated with arrows. For example, the Examiner will note that the dative bonds between the N and Ni atoms of the structures in cols. 5-8, for example, of U.S. 5,866,663 (Brookhart et al) are represented by solid single bond lines. The Applicants also enclose a copy of pages 110-111 of General Chemistry Principles and Structure (Brady, J.E. and Humiston, G.E., John Wiley & Sons, 1978), which provides a discussion of dative bonds. The Examiner's attention is directed to the discussion above the fourth structure on page 111, which indicates that it is more accurate to use a solid single bond line to illustrate the dative bond between the two atoms. Accordingly, there is no basis for the Examiner's rejection that, because the Applicants did not use an arrow to depict the dative bond, the Applicants did not have possession of the invention at the time of filing.

It is therefore respectfully submitted that it would be clear to a person of ordinary skill in the art that the bonds between the N and Ni atoms in the structures in Table I on page 15 are dative bonds based on known coordination chemistry and from the description of the ligand. In the ligand of the structures, the N atom is covalently bonded to two carbon atoms to produce three N-C bonds. The N atoms of the ligand thus have a lone pair of electrons available for bonding to the Ni atoms. Accordingly, the Applicants

reasonably believe that the bonds between the N and Ni atoms are dative in the exemplary structures illustrated in Table I of page 15.

Moreover, the Examiner states that "*For instance, the actual formulas in table I could have been some sort of Zwitterionic structures, or the entire formulas could have been some sort of ionic species.*" Therefore, it appears that the Examiner is concurring with the Applicants that the bonds between the N and Ni atoms in the exemplary structures of Table I are not covalent and that the Applicants should therefore not be limited to covalent bonds between the elements E and M. Nevertheless, it is respectfully submitted that it would be very clear to a person of ordinary skill in the art that the exemplary structures of Table I are not zwitterionic structures or that the entire formulas are some sort of ionic species. Moreover, it is unreasonable for the Examiner to expect a characterization of each bond in the claimed catalyst. The Applicants recite in the independent claims that the bidentate ligand stabilizes the metal complex. Accordingly, the bond between E and M stabilizes the metal complex, no matter what the nature of the bond.

The Applicants have also noted that the Examiner does agree, elsewhere in the Office Action under response, that the term "bonded" is appropriate for the interaction between E and M. The Examiner's attention is directed to his suggestion for amendment to claims 1 and 13 to overcome his rejection under 35 U.S.C. § 112, 2nd paragraph, at lines 1-3 of page 5 of the Office Action. The Examiner suggested that, instead of using the word "stabilized", the words "-- bonded to -- be used instead since the entire entity is a molecule". The rejection of the word "stabilized" is addressed in more detail below. However, it must be noted that in one part of his Office Action, the Examiner suggests that the word "bonded" is descriptive of the interaction between the ligand and metal complex. The Examiner will note that the ligand stabilizes the metal complex by bidentate bonding of E to M. Accordingly, it would appear that the Examiner does not agree that the independent claims should recite that "each E is independently a Group 15 or 16 element bonded to M".

The Examiner has further asserted that "*It is not clear from the specification what the intended correction was to be*", citing *In re Oda* for support. The Examiner is now limiting the Applicants to covalent bonds between the E and M elements on the basis that

there was one instance of the term "covalently bonded" in the specification as originally filed. The Examiner is ignoring the fact that the exemplary structures of Table I do not depict covalent bonds, as strictly defined above, to a person of ordinary skill in the art. Furthermore, the independent claims as originally filed required that the metal complex be "stabilized by a bidentate ligand". It would be apparent to a person of ordinary skill in the art that the term "stabilized by a bidentate ligand" inherently means that there are at least two bond(s) between the ligand and metal complex. It is therefore unreasonable for the Examiner to require that the nature of the bond between elements E and M when the claim recites a metal complex stabilized by a bidentate ligand.

In re Oda cites *Quigley v. Zimmerman* (22 CCPA 713, 73 F.2d 499, 23 USPQ 310, 314 (1934)), stating "*That amendments may be made to patent applications for the purpose of curing defects, obvious to one skilled in the art, in the drawings or written descriptions of inventions, is so well settled that we deem it unnecessary to cite authorities in support thereof.*" It is respectfully submitted that, for the reasons stated above, the error in inadvertently limiting the bond between elements E and M on page 3, line 10 to only covalent bonds would be obvious to one skilled in the art.

Accordingly, for all of the reasons discussed above and because the Examiner himself suggests that the word "bonded" is appropriate for the interaction between the ligand and metal complex, the Applicants respectfully request that the Examiner withdraw his rejection under 35 U.S.C. § 112, 1st paragraph.

Rejection under 35 U.S.C. § 112, 2nd Paragraph

The Examiner has rejected claims 1-5, 13-21, 30 and 32 under 35 U.S.C. § 112, 2nd paragraph as being indefinite. Each of the terms rejected by the Examiner in Paragraph 8 of the Office Action under response are discussed below.

"For polymerization of olefin monomers"

Specifically, the Examiner has asserted that the recitation of "for polymerization of olefin monomers" carries no patentable weight. The Applicants respectfully disagree with the Examiner. As indicated in MPEP § 2111.02, an amendment to a preamble must be looked at on a case-by-case basis. "*Whether a preamble stating the purpose and*

context of the invention constitutes a limitation of the claimed process is determined on the facts of each case in light of the overall form of the claim, and the invention as described in the specification and illuminated in the prosecution history" (Applied Materials Inc. v. Advanced Semiconductor Materials America, Inc., 98 F.3d 1563, 1573, 40 USPQ2d 1481, 1488 (Fed. Cir. 1996)).

The amendment to the preamble to recite the intended use was made to more clearly distinguish over the cited art, specifically the Sommazzi reference. As further stated in MPEP § 2111.02, *"in apparatus, article, and composition claims, intended use must result in a structural difference between the claimed invention and the prior art in order to patentably distinguish the claimed invention from the prior art."* As discussed more fully below, in the response to the rejection under § 102(b) in view of Sommazzi, there is a structural difference between the claimed catalyst and the cited Sommazzi reference which is more clearly distinguished in the amendment to the preamble.

The Examiner is urged to withdraw his rejection of the preamble under 35 U.S.C. § 112, 2nd paragraph.

"Stabilized"

The Examiner also alleges that it is not clear what the Group 9, 10 or 11 metal complex is "stabilized" against. The Applicants intended the word "stabilized" to mean that the Group 9, 10 or 11 metal complex is stabilized against decomposition, including reduction to metal and/or dimerization. It is respectfully submitted that this term is clear to a person of ordinary skill in the art reading the phrase *"a Group 9, 10 or 11 metal complex stabilized by a bidentate ligand"* as meaning that the bidentate ligand stabilizes the complex against decomposition. For the Examiner's convenience, the Applicants enclose a copy of page 1899 of the 5th Edition of the McGraw-Hill Dictionary of Scientific and Technical Terms which defines stability as *"the property of a chemical compound which is not readily decomposed and does not react with other compounds"*. However, it is clear that the catalyst must still be reactive, by the use of the word "catalyst" and the disclosed utility for polymerization of olefin monomers. It is therefore respectfully submitted that a person of ordinary skill in the art would understand that the bidentate ligand stabilizes the metal complex against decomposition.

The Examiner has suggested that the word "stabilized" be replaced with the words "--bonded to--". However, this would change the meaning intended by the Applicants in this portion of the claim. The Applicants do indicate, later in claims 1 and 13, that the bidentate ligand is bonded to the Group 9, 10 or 11 metal through element E of the ligand.

For the reasons discussed above, the Examiner is urged to withdraw his rejection of claims 1 and 13, under 35 U.S.C. § 112, 2nd paragraph, in the use of the word "stabilized".

Antecedent basis for "the Group 9, 10 or 11 metal complex"

The Examiner has also rejected the preambles of claims 1 and 13 because the phrase "*the Group 9, 10 or 11 metal complex*" strictly lacks antecedent basis. Specifically, the Examiner is suggesting that the phrase before the formula be amended to read "*the Group 9, 10 or 11 metal complex stabilized by a bidentate ligand*". Though the Applicants believe that the phrase "*the Group 9, 10 or 11 metal complex*" is clear, the Applicants have amended the claim in accordance with the Examiner's request. Accordingly, the rejection under 35 U.S.C. § 112, 2nd paragraph, has been overcome.

"Oxidation state of MX_r is satisfied"

The Examiner has rejected the phrase "*the oxidation state of MX_r is satisfied*" at the end of the recitation of the identity of the L group of claims 1 and 13 because it is not clear. The Examiner has queried whether the term means that the oxidation state of the entire LMX_r molecule is neutral. The Examiner is correct that the oxidation state of the entire LMX_r is neutral. However, the Applicants do not agree that this meaning would "*conflict with the recitations of claims 17 and 21, in which the metal-containing species is a cation*".

Page 2, line 21, as originally filed, states that the polymerization catalysts of the present invention can be derived from late transition metal compounds of the formula LMX_r . The Applicants envisioned that compounds of the formula LMX_r can be catalytically competent or that the compounds of the formula LMX_r can be treated with an activator. Claims 17 and 21 have now been amended to clarify the original intent of

the claims. The claims now recite that the LMX_r complex has been treated with a noncoordinating anion precursor to form an ionic catalyst comprising a metal cation and a noncoordinating anion. Support for the amendments to claims 17 and 21 can be found on page 4, line 33 to page 5, line 9, page 6, lines 11-25 and page 7, lines 18-19. Claims 17 and 21 illustrate preferred methods of treating late transition metal compounds with an activator. It is believed that the rejections of claims 1, 13, 17 and 21 have been overcome by the amendments to claims 17 and 21.

"Hydrocarbyl containing"

The Examiner has requested the insertion of a hyphen between the words "hydrocarbyl" and "containing" in the fifth line from the end of both independent claims. Claims 1 and 13 have been amended as requested by the Examiner.

"Or other univalent anionic ligand"

The Examiner also asserts that "or other univalent anionic ligand" is omnibus, vague and indefinite in the fourth line from the end of claims 1 and 13. Claims 1 and 13 have been amended to recite "a univalent anionic ligand" as a possible X group. Examples of a univalent anionic ligand are a halogen, an alkoxide, and amide and a phosphide as indicated on page 2, at line 38. Other suitable univalent anionic ligands will be readily apparent to a person of ordinary skill in the art upon reviewing the list of example univalent anionic ligands. It is believed that the amendment to claims 1 and 13 will overcome the Examiner's rejection.

"Square planar geometry"

The Examiner has rejected claims 30 and 32 because it is not clear about what entity the "square planar geometry" is "stabilized". Claims 30 and 32 have been amended to indicate that LMX_r has a square planar geometry. It is believed that this amendment will overcome the Examiner's rejection.

"Anion precursor"

The Examiner is still not clear what is meant by "anion precursor" in claim 19. Accordingly, claim 19 has been amended to clarify that the precursor is a noncoordinating anion precursor. The term "noncoordinating anion precursor" is defined on page 6 at lines 11-25, as originally filed. It is believed that the amendment to claim 19 will overcome the Examiner's rejection of the term "anion precursor" under 35 U.S.C. § 112, 2nd paragraph.

The Applicants have addressed each of the terms rejected by the Examiner under 35 U.S.C. § 112, 2nd paragraph, and have provided amendments and/or arguments in support of the terms. The Examiner is therefore urged to reconsider his rejections under 35 U.S.C. § 112, 2nd paragraph.

Rejection under 35 U.S.C. § 102(b)

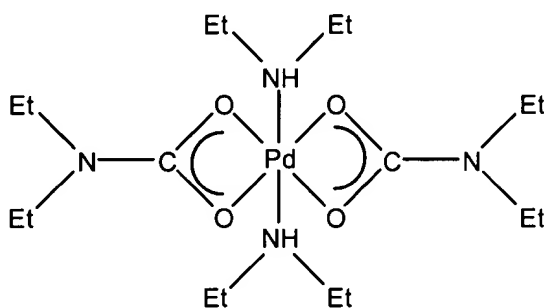
The Examiner has rejected claims 1-3, 5, 13-15, 30 and 32 under 35 U.S.C. § 102(b) as being anticipated by Sommazzi for the reasons presented in Paragraph 12 of the Office Action dated October 6, 1998. The Examiner has rejected the arguments presented in the response dated February 8, 1999 as *"being more suitable to a 35 USC 103 rejection"*.

It is respectfully submitted that, for the reasons discussed below, Sommazzi does not teach the claimed catalyst. Accordingly, the Examiner must withdraw his rejection under 35 U.S.C. § 102(b) as being anticipated by Sommazzi. To the extent that the Examiner elects to apply the Sommazzi reference to reject the claims under 35 U.S.C. § 103, the independent claims were amended in the response dated February 8, 1999 to recite that the catalyst system is used "for polymerization of olefin monomers". The rejection against this amendment is addressed above.

As stated in the response dated February 8, 1999, Sommazzi describes a hydroformylation catalyst and process for the production of alternating olefin/carbon monoxide copolymers. The hydroformylation catalyst is constituted by (a) the solid compound produced from the interaction of $\text{Pd}(\text{O}_2\text{CNEt}_2)_2(\text{NHEt}_2)_2$ with a solid carrier, (b) a mono- or bidentate ligand containing one or two nitrogen or phosphorous atoms,

capable of binding to the Pd atom through dative bonds, and (c) a mineral or organic acid, such as trifluoroacetic acid, p-toluene sulfonic acid, sulfuric acid, or alkane sulfonic acids.

First, Sommazzi does not teach the claimed catalyst. The Applicants believe that the structure for $\text{Pd}(\text{O}_2\text{CNEt}_2)_2(\text{NHEt}_2)_2$ can be represented as shown below:



However, there is no illustration or discussion in Sommazzi of the composition of the metal complex with the ligand attached. There is likewise no discussion in Sommazzi of whether any of the groups bonded to the metal center are abstracted to allow for bonding of a bidentate ligand. Accordingly, Sommazzi does not anticipate the claimed invention because Sommazzi does not teach the claimed catalyst. The Examiner is urged to withdraw his rejection under 35 U.S.C. § 102(b).

Second, it is generally accepted by those skilled in the art that the active center of a catalyst useful for polymerization of polyolefins must have a metal-carbon bond as a propagating chain unit. As the Examiner can see by the above structural formula for Sommazzi's palladium complex, there is no metal-carbon bond. Furthermore, Sommazzi's bidentate ligand is datively bonded to the Pd atom through 2 nitrogen or phosphorus atoms. Accordingly, even when the ligand is bonded to the Pd atom, there is no metal-carbon bond. Moreover, Sommazzi does not teach or suggest how to activate his catalyst for polymerization of polyolefins, because his catalyst is for alternating olefin/carbon monoxide copolymers. It is therefore believed that Sommazzi, in accordance with those skilled in the art, understood that hydroformylation catalyst systems, such as that described in Sommazzi, are useful strictly to make alternating olefin/carbon monoxide copolymers. Furthermore, it is generally known to those skilled

in the art that catalyst systems such as that described in Sommazzi do not function in the absence of carbon monoxide.

In the claimed catalyst of the present application, the X group often provides a metal-carbon bond for a propagating chain unit. However, to the extent that X does not provide a metal-carbon bond, the present application teaches that an activator is used to treat the compound LMX_r to provide a metal-carbon bond for a propagating chain unit. See, for example, page 2, line 34 to page 3, line 3 and page 4, lines 33-35. Accordingly, the catalyst system of Sommazzi does not fall within the scope of the catalyst system recited in the independent claims. The Applicants, therefore, respectfully urge the Examiner to withdraw his rejection of claims 1-3, 5 and 13-15 under 35 U.S.C. § 102 (b) in view of Sommazzi.

Furthermore, as discussed above, a person of ordinary skill in the art would not expect the catalyst described in Sommazzi to be useful for the polymerization of olefin monomers. Accordingly, the Applicants respectfully submit that the Examiner cannot reject the claims under 35 U.S.C. § 103 in view of Sommazzi.

Rejection under 35 U.S.C. § 102(e)

The Examiner has rejected claims 1-5, 13-15, 30 and 32 under 35 U.S.C. § 102(e) as being anticipated by Brookhart et al (U.S. Patent No. 5,866,663).

The Examiner has pointed to the abstract, col. 1-33, col. 38, top, and Example 98 of Brookhart et al in support of his position that "*Brookhart discloses the present invention as claimed*". This rejection is respectfully traversed for the following reasons.

The Applicants have reviewed the abstract and col. 1-33 and could not find any reference to a supported catalyst, as claimed in the present application. The Applicants are not certain what the Examiner intended by "top" as a descriptor of col. 38. However, the Applicants have reviewed all of col. 38 and, again, could not find any reference to a supported catalyst.

Example 98 of Brookhart et al is a polymerization example, using as a catalyst, silica impregnated "*with a methylene chloride solution of $\{[(2,6-i-PrPh)_2DABMe_2]PdCH_2CH_2C(O)CH_3\}SbF_6^-$ to give a 10 wt % loading of the catalyst on silica.*" The 10 wt.% loading of the palladium compound is equivalent to a loading of

156 micromoles Pd per gram of silica. This transition metal loading is greater than the transition metal loading of less than 100 micromoles transition metal per gram of solid support recited in claim 1 of the present application. Accordingly, the Examiner's rejection of claim 1 and its dependent claims under 35 U.S.C. § 102(e) must be withdrawn.

The Applicants reasonably believe that the supported catalyst prepared in Example 98 has residual solvent. There is nothing in Example 98 which appears to teach or suggest that the residual solvent was removed from the catalyst prior to polymerization. Claim 13 of the present application recites "a late transition metal catalyst system essentially without residual solvent". This recitation is not taught in the cited passages of the Brookhart et al reference. Accordingly, the Examiner's rejection of claim 13 and its dependent claims under 35 U.S.C. § 102(e) must be withdrawn.

For the reasons discussed above the Examiner's rejection of claims 1-5, 13-15, 30 and 32 under 35 U.S.C. § 102(e) as being anticipated by Brookhart et al must be withdrawn.

The Applicants believe that the amendments and arguments presented herein are sufficient to overcome the Examiner's rejections.

The Applicants also believe that the present application has been patentably distinguished over all of the cited references and is in good condition for allowance. Accordingly, the Applicants respectfully request that the Examiner reconsider the Applicants' application in view of the arguments and amendments presented herein and allow all claims, as amended.

Respectfully submitted,

September 28, 1999
Date of Signature


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GENERAL CHEMISTRY PRINCIPLES AND STRUCTURE

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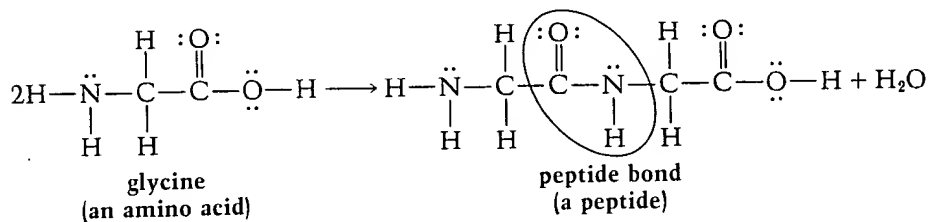
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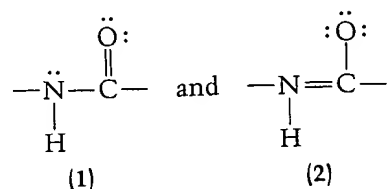
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nance. For example, the nitrate ion, NO_3^- , and the carbonate ion, CO_3^{2-} , have the same number of valence electrons as SO_3 and therefore have similar resonance structures.

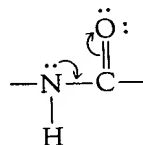
Resonance is certainly not restricted to inorganic compounds. In proteins, for example, amino acids are linked together in long chains by "peptide bonds."



There is evidence that the C—N bond in the peptide linkage actually lies somewhere between a single bond and a double bond. To explain this it is suggested that the peptide bond is a resonance hybrid of structures such as

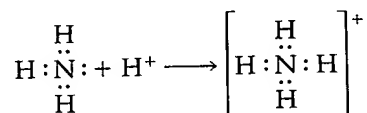


Structure 2 is obtained by rearranging the electrons in structure 1 in this way:



4.6 COORDINATE COVALENT BONDS

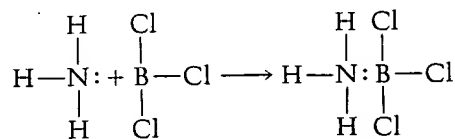
When a nitrogen atom combines with three hydrogen atoms to form the molecule NH_3 , the N atom has completed its octet. We might expect, therefore, that the maximum number of covalent bonds that we would observe an N atom to form is three. There are instances, however, where N may have more than three covalent bonds. In the ammonium ion, NH_4^+ , which is formed in the reaction



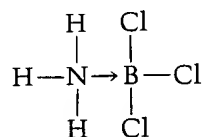
the nitrogen is covalently bound to four hydrogen atoms. When the additional bond between the H^+ and the N atom is created, both of the electrons in the bond come from the nitrogen. *This type of bond, where a pair of electrons from one atom is shared by two atoms, is called either a coordinate covalent bond, or a dative bond.* It is important that you remember that the

coordinate covalent bond is really no different, once formed, than any other covalent bond and that our distinction is primarily aimed at keeping track of electrons; that is, it is "bookkeeping."

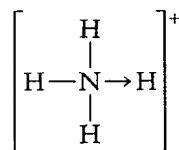
When Lewis structures are written using dashes to represent electron pairs, the coordinate covalent bond is sometimes indicated by means of an arrow pointing away from the atom supplying the electron pair. For example, the product of the reaction of boron trichloride, BCl_3 , and ammonia, NH_3 , is a substance known as an **addition compound** (because it is formed by the simple addition of two molecules).



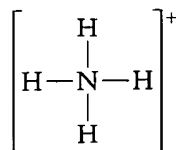
To show that the electron pair shared between the B and N originates on the nitrogen, the Lewis structure of this addition compound can be written



Using this type of notation we are tempted to write the structure of the NH_4^+ ion as



This gives the impression that one of the N—H bonds is different from the other three. It has been shown experimentally, however, that all four N—H bonds are identical. Therefore, to avoid conveying false impressions, the NH_4^+ ion is written simply as



4.7 BOND ORDER AND SOME BOND PROPERTIES

The term **bond order** refers to the number of covalent bonds that exist between a pair of atoms. For example, the carbon-carbon bond order in acetylene, C_2H_2 , is 3; in ethylene, C_2H_4 , it is 2; and in ethane, C_2H_6 , it is 1. Fractional bond orders are also possible, as in the case of SO_2 . Each SO bond in the two resonance structures we draw for SO_2 is shown as a single bond in one structure and a double bond in the other. As we might expect, the bond order in sulfur dioxide is intermediate between 1 and 2.

The concept of bond order arises as a result of our description of the bonding in covalent molecules. Since we cannot view electrons directly, we

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passing between it and a similar roller. { 'skwēz }

collon [ELECTROMAG] Length of waveguide conductor; alteration of the critical dimension is possible corresponding alteration in the electrical length. { 'skwēn }

time [MET] In resistance welding, the time between application of the current and of the pressure. { 'skwēn }

locking oscillator. { 'skweg-ər }

condition [ELECTR] Condition of self-blocking in an oscillator circuit. { 'skweg-iŋ }

oscillator See blocking oscillator. { 'skweg-iŋ ,äs }

control [ELECTR] To automatically quiet a receiver by reducing in response to a specified characteristic of the signal. { 'skwelch }

noise suppressor. { 'skwelch ,særkət }

flash A small tube filled with fine-grained black powder; lighting and burning of the ignition match, the rocket effect and darts back into the hole to powder charge. [ORD] A small explosive device, appearance to a detonator, but loaded with low explosive; its output is primarily heat (flash); usually electrically initiated and provided to initiate action of pyrotechnic rocket propellants. { 'skwib }

cephalopod [ZOO] Any of a number of marine cephalopod mollusks characterized by a reduced internal shell, ten tentacles, and chromatophores. { 'skwid }

superconducting quantum interference device. { 'skwid }

family [INV ZOO] The single family of the eumalacostraca, the mantis shrimp. { 'skwil-ə,dē }

arch [MATH] A small arch across the interior corner of a support a superimposed mass such as a dome or known as squinch arch. { 'skwinch }

See squinch. { 'skwinch ,ärch }

angle [ELECTROMAG] 1. The angle between the two major lobes of a radar lobe-switching antenna. 2. The angular distance between the axis of radar antenna radiation and a geometric axis, such as the axis of the reflector. 3. The angle between the full-right and full-left positions of the conical-scan radar antenna. [MED] See strabismus. { 'skwɔ:l }

tree [MERT ZOO] Any of over 200 species of arboreal mammals of the families Sciuridae and Anomaluridae having a long, strong hind limbs. { 'skwɔ:l }

motor [ELEC] An induction motor in which the primary circuit consists of a squirrel-cage winding around the iron core. { 'skwɔ:l ,kāj ,mōd-ər }

rotor See squirrel-cage winding. { 'skwɔ:l ,kāj }

winding [ELEC] A permanently short-circuited winding, usually uninsulated, around the periphery of the rotor by continuous end rings. Also known as squirrel-cage winding. { 'skwɔ:l ,kāj ,wīnd-iŋ }

can [ENG] An oil can with a flexible bottom and a nozzle; pressure applied to the bottom forces oil out the nozzle. { 'skwɔ:t ,kan }

device [ENG] A device with a bulb and nozzle; when the bulb is pressed, liquid squirts from the nozzle. { 'skwɔ:t ,gən }

See compaction. { 'skwish-iŋ }

transmitter [ELECTR] Random firing, intentional or otherwise, of a transmitter in the absence of interrogation. { 'skwish-iŋ }

response chain. { 'skwish-iŋ }

oil [MATER] A viscous, unfiltered lubrication oil, made from reduced petroleum crudes that have had the lubricant fractions removed by direct steam heating;

used to lubricate steam engine cylinders and valves. Also known as steam-refined cylinder oil. { 'es ,är 'sil-ən-dər ,oil }

SRMS See structure resonance modulation spectroscopy.

SRS See Sonobuoy Reference System.

SS See stainless steel.

SS 433 [ASTRON] A stellar object that shows evidence of ejection of two narrow streams of cool gas travelling in opposite directions from a cool object at a velocity of almost one-quarter the speed of light; the beams execute a repeating, rotating pattern about the central object once every 164 days. { ,es ,es ,fɔ:r ,thərd-ē 'thrē }

SSB See single-sideband.

SS Cygni stars See U Geminorum stars. { 'es ,es 'sign-ē ,stärz }

SSD See steady-state distribution.

SSI See small-scale integration.

ss loran See sky-wave-synchronized loran. { 'es ,es 'lɔ:r ,an }

SSM See surface-to-surface missile.

SSP See static spontaneous potential.

SSR See solid-state relay.

SST See supersonic transport.

S star [ASTRON] A spectral classification of stars, comprising red stars with surface temperature of about 2200 K; prominent in the spectra is zirconium oxide. { 'es ,stär }

s-state [QUANT MECH] A single-particle state whose orbital angular momentum quantum number is zero. { 'es ,stāt }

SSTV See slow-scan television.

SSU See Saybolt Seconds Universal.

St See stoke.

stab [ENG] In a drilling operation, to insert the threaded end of a pipe joint into the collar of the joint already placed in the hole and to rotate it slowly to engage the threads before screwing up. { 'stab }

stab culture [MICROBIO] A culture of anaerobic bacteria made by piercing a solid agar medium in a test tube with an inoculating needle covered with the bacterial inoculum. { 'stab ,kæl-čər }

stabilator [AERO ENG] A one-piece horizontal tail that is swept back and movable; movement is controlled by motion of the pilot's control stick; usually used in supersonic aircraft. { 'stā-bə ,lād-ər }

stability [CHEM] The property of a chemical compound which is not readily decomposed and does not react with other compounds. [CONT SYS] The property of a system for which any bounded input signal results in a bounded output signal. [ENG] The property of a body, as an aircraft, rocket, or ship, to maintain its attitude or to resist displacement, and, if displaced, to develop forces and moments tending to restore the original condition. [FL MECH] The resistance to overturning or mixing in the water column, resulting from the presence of a positive (increasing downward) density gradient. [GEOL] 1. The resistance of a structure, spoil heap, or clay bank to sliding, overturning; or collapsing. 2. Chemical durability, resistance to weathering. [MATER] Of a fuel, the capability to retain its characteristics in an adverse environment, for example, extreme temperature. [MATH] Stability theory of systems of differential equations deals with those solution functions possessing some particular property that still maintain the property after a perturbation. [MECH] See dynamic stability. [PHYS] 1. The property of a system which does not undergo any change without the application of an external agency. 2. The property of a system in which any departure from an equilibrium state gives rise to forces or influences which tend to return the system to equilibrium. Also known as static stability. [PL PHYS] The property of a plasma which maintains its shape against externally applied forces (usually pressure of magnetic fields) and whose constituents can pass through confining fields only by diffusion of individual particles. { stə 'bil-əd-ē }

stability augmentation system [AERO ENG] Automatic control devices which supplement a pilot's manipulation of the aircraft controls and are used to modify inherent aircraft handling qualities. Abbreviated SAS. Also known as stability augmentors. { stə 'bil-əd-ē ōg-mən-tā-shən ,sɪs-təm }

stability augmentors See stability augmentation system. { stə 'bil-əd-ē ōg-men-tərz }

stability chart [METEOROL] A synoptic chart that shows the distribution of a stability index. { stə 'bil-əd-ē ,čärt }

stability constant [CHEM] Refers to the equilibrium reaction of a metal cation and a ligand to form a chelating mononuclear complex; the absolute-stability constant is expressed by the pro-

SQUID



Dorsal view of a squid (*Loligo*).